Support/Maintenance Software

DVS Defragmenter

User Guide

DVS Defragmenter User Guide

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User Guide Version 1.0 for the DVS Defragmenter Version 2.0

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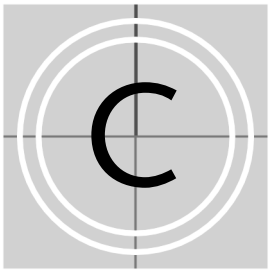

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Introduction

The DVS Defragmenter is a service and maintenance tool designed to remedy problems such as dropped frames that occurred during play-out operations. With it you can optimize the physical alignment of image sequences on hard disk arrays (video clips) so that they are more suited for a real-time play-out.

The alignment of clips on the hard disk array is of special importance when dealing with clips of formats of HD or larger: Although DVS video systems and their video storages are all capable to deal with almost any high-resolution material in real time, the performance of the hard disks is limited and may soon be reached, especially when the storage contains large amounts of data. Then, a real-time play-out may get interrupted due to the fact that clips are distributed in fragments over the volume and disk drives tend to get slower the fuller they are. To optimize individual clips of higher resolutions you may use this defragmentation program.

1.1 Overview

This user guide informs you about the general handling of the DVS Defragmenter as well as about the complete controllable interface.

The chapters in this user guide contain the following information:

Chapter 1	Begins with a short introduction to the DVS Defragmenter, followed by a note regarding the audience this manual is written for and an explanation of the applied conventions. Furthermore, it lists the system requirements to run the DVS Defragmenter and some important notes that you must read.
Chapter 2	This chapter provides basic information about the program. Here you can find details about how to install the program (in case it is not already available on your system). Furthermore, the most basic handling will be explained, i.e. how to start and exit the program.
Chapter 3	Explains how to operate and handle the DVS Defragmenter, i.e. how to perform a defragmentation.
Chapter 4	Describes shortly the user interface of the program. You may use this chapter as a reference to individual program items or features.
Index	This chapter facilitates the search for specific terms.

1.2 Target Group

To use this manual and the DVS Defragmenter you should have experience in PC handling and be familiar with the handling of a device connected to a video hard disk array.

1.3 Conventions Used in this User Guide

The following typographical conventions will be used in this documentation:

- Texts preceded by this symbol describe activities that you must perform in the order indicated.
– Texts preceded by this symbol are parts of a list.

Texts preceded by this symbol are general notes intended to facilitate work and help avoid errors.

You must pay particular attention to text that follows this symbol to avoid errors.

“ ” Texts enclosed by quotation marks are references to other manuals, guides, chapters, or sections.

Menu	Standard text in italic and bold indicates a menu name or options in a menu list
Menu » Option	In the specified menu select the stated option
BUTTON	Standard text in small caps and bold indicates push buttons
Item	Standard text in bold only stands for other labelled items of the user interface
File	Directory structure or file
Entry	Parameters, selections or entries made in the program
[Key]	An individual key or a key combination on a keyboard

Keyboard Short-cuts

To perform options or procedures with the keyboard often requires simultaneous pressing of two keys.

Example:

[Ctrl + F1]	If this is given, hold down the [Ctrl] key and press simultaneously the [F1] key.

1.4 System Requirements

Supported Hardware

The DVS Defragmenter can be used with the SNFS (Store Next File System) of the DVS-SAN manufactured by DVS.

To perform a defragmentation the DVS Defragmenter program needs valid DVS license keys for the hard disks to be defragmented. For further information about license keys please contact the DVS service department.

Supported Operating System

The program can be executed on the Windows XP operating system.

Required Software

The DVS Defragmenter does not require the installation of any other DVS software, such as the CLIPSTER software, the video board driver, or similar.

1.5 Important Notes

To use the DVS Defragmenter correctly it is important that you heed the following:

The DVS Defragmenter is no inspection or preventive tool. It is a service tool to be used in case of problems such as dropped frames only.

The DVS Defragmenter should not be used for the defragmentation of a complete hard disk, but for single clips when play-out problems occurred. It optimizes individual clips for play-out operations only.

The DVS Defragmenter displays the fragmentation degree of video clips via colors. These do not indicate whether these clips are real-time capable or not. Most video clips marked as fragmented will be real-time capable nevertheless.

Do not start a real-time operation when running the DVS Defragmenter. Then drops may occur. It is recommended to close the video play-out/record application when using the DVS Defragmenter.

The DVS Defragmenter uses proprietary routines to defragment the data on the hard disks. The results will not be the same when using the standard defragmentation tool of the operating system, because it does not apply the same routines and will not observe image file sequences. Therefore, do not use it for a defragmentation of the video hard disk array.

To perform a defragmentation the DVS Defragmenter program needs valid DVS HDD license keys for the video storage(s) to be defragmented.

At all times leave about 15% of the overall video storage capacity empty of data for real-time performance reasons.

On SNFS storages the DVS Defragmenter should not be used for clips of lower resolutions (video formats) such as SD. Such clips will still be real-time capable even when fragmented. If necessary at all, the program should be used for clips of large video formats and file sizes only.

To run the DVS Defragmenter on an SNFS storages you must log on to the computer system with administrative rights for the storage.

The DVS Defragmenter may influence the structure of the data storage. It may cause fragmentations to clips added to the array after a defragmentation session. Currently this cannot be avoided.

It is recommended to format the SNFS storage from time to time for optimum performance reasons. The frequency of the formatting should depend on the usage of the DVS-SAN. Experience shows that a formatting of every four to eight weeks will result in an overall good performance. To make this easy it is best to split the real-time storage into two to four volumes. With this you will be able to copy data between the volumes to receive a free one for formatting.

Getting Started

This chapter provides you with some basic information necessary to get the DVS Defragmenter program running. First, it will be explained how to install the program (in case it is not already available on your system) and how to set a license key. After this it is described how to start and end the program.

2.1 Installation

Usually it is not necessary to install the DVS Defragmenter program because on most DVS systems it will already be available. However, if this is not the case, it can be installed as described in this section.

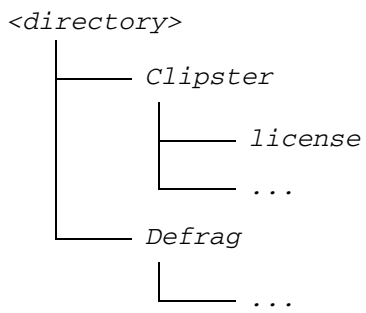
To check whether the DVS Defragmenter is already installed on your system simply try to start it as detailed in section "Starting the Program" on page 2-4.

2.1.1 Installing the DVS Defragmenter

The DVS Defragmenter installation routine is a single executable file. To install the DVS Defragmenter program perform the following:

- Execute the installation file, for example, with a double-click of the mouse.

This starts the installation routine which will guide you through the installation. When the installation program asks for the directory where to install the DVS Defragmenter, act according to the system where you want to install the program:

CLIPSTER, Pronto2K.2, ProntoHD.2	– When installing the DVS Defragmenter on a DVS video system connected to a DVS-SAN, it should be installed on the same level as the *Clipster* program directory because then it can access the same license keys as the main DVS software: 
other computer systems	– When installing the DVS Defragmenter on a computer system that is not a DVS video system (such as the metadataserver of a DVS-SAN), the system must provide an account with administrative rights for the storage to be defragmented. – The program should be installed in the suggested installation directory, i.e. *C:\Program Files\DVS\Defrag*.

Once the installation is initialized, all necessary files and libraries will be installed on the computer system. The installation is finished as soon as a message reports this.

Then, as the next step you may have to set license keys.

2.1.2 Setting License Keys

The DVS Defragmenter needs properly licensed hard disks to perform a defragmentation process. On a DVS video system connected to a DVS-SAN (CLIPSTER/Pronto2K.2/ProntoHD.2) those will already be installed and the DVS Defragmenter can be used immediately. But, when installing the DVS Defragmenter in a stand-alone setup on a computer system connected to a DVS-SAN such as the metadataserver, it may be necessary to set license keys.

When receiving the installation file for the DVS Defragmenter program, you will also have received one or more text files that contain the necessary licenses. With them perform the following:

- If applicable, close the DVS Defragmenter program.
- Copy the provided license key files without any alterations to their contents into the subdirectory *license* under the DVS Defragmenter software's installation path (see section "Installing the DVS Defragmenter" on page 2-2).

After this the license keys are successfully set. Next time you start the DVS Defragmenter, it will scan the files stored under the directory *license*. All files in this directory will be scanned regardless of their file name and, if valid, the license keys will be combined. In case you experienced warning messages because of unlicensed disks, they should be resolved.

2.2 Starting the Program

This section provides you with a description how to get the DVS Defragmenter started. To start the program you have to do the following:

- Select from the **START** button menu of Windows on the ***DVS*** menu the entry for the DVS Defragmenter (for example, ***All Programs » DVS » DVS Defrag***).

  If available, you may also start the program via the **DVS Defrag** icon on the desktop of Windows.

This will load the DVS Defragmenter program and its user interface will be displayed on the screen.

2.3 Exiting the Program

To end the DVS Defragmenter program and exit it perform the following:

- Use either one of the following possibilities:

button **EXIT**	With the **EXIT** button in the lower right corner of the user interface you can exit the DVS Defragmenter program. After its activation a message box will appear on the screen asking you whether the program should really be terminated. Once this is confirmed, the program will be closed.
[Alt + E]	Same as button **EXIT**.
[Alt + F4]	Same as button **EXIT**.
	Same as button **EXIT**.

After this the DVS Defragmenter program is closed.

Using the DVS Defragmenter

This chapter describes shortly how to use the DVS Defragmenter.

Before using the DVS Defragmenter it is important that you read and observe the notes detailed in section “Important Notes” on page 1-5.

With the DVS Defragmenter you can remedy problems such as dropped frames that occurred during play-out operations. It optimizes the alignment of image sequences on hard disk arrays (video clips) so that they are more suited for a real-time play-out.

To use the DVS Defragmenter you have to perform the following steps:

1. Scan a volume (drive) or individual directory to gather information about the available video material. The detected video material will be displayed in the clip list in the middle of the user interface.
2. From the clip list assemble the defragmentation job list.
3. Afterwards edit and refine the job list, for example, by altering the sequence of the defragmentation process to be executed.
4. And finally, start the defragmentation – either an immediate or a scheduled one – with the respective controls.

All these steps will be described in step-by-step descriptions in this chapter. It starts with an explanation about how to scan for clips, followed by a description how to add fragmented clips to the job list for a subsequent defragmentation. The chapter will be concluded with a description how to refine the job list and defragment the selected clips.

For more information about the individual items of the user interface please refer to the chapter “The User Interface” on page 4-1.

3.1 Scanning a Storage

After starting the program a volume or individual directory has to be scanned to gather information about the available video material. With this you will include the latest data available at the selected location and ascertain the state of individual clips.

To perform a scanning the items in the upper part of the DVS Defragmenter's user interface are available:

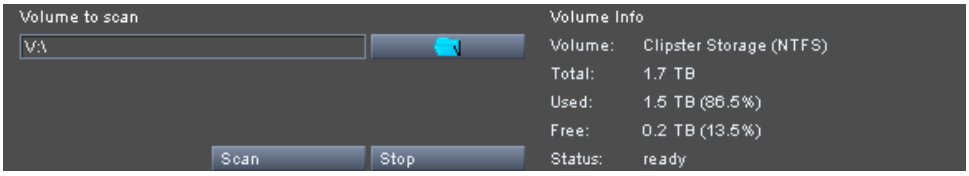


Figure 3-1: Items for a scanning

- Type in in the entry field at the top left of the area providing the scanning items the drive letter of the hard disk array or the directory path to the clip(s) that you want to scan.

  Alternatively, you may also select a drive or directory with the button to the right of the entry field ( ). It will open the standard dialog window to select a drive/directory.

- Next use the button **SCAN** to start the scanning process.

A defragmentation degree detected during a scanning depends on the setting for contiguous frames of the defragmentation controls, i.e. when larger blocks are selected in **Contiguous Frames**, clips may be shown as segmented that would otherwise be displayed as 100% defragmented (see section "The Defragmentation Controls" on page 4-14).

Once a scanning operation is initiated, the contents of the selected location will be examined and analyzed, and the found video material will be displayed in the clip list of the DVS Defragmenter. There you can discern the respective state (fragmentation degree) of the video clips immediately. Additionally, during the scan the properties of the selected volume will be displayed at the top right of the DVS Defragmenter's user interface. A scan in progress can be aborted at any time manually with the button **STOP** right beside the button to start a scanning.

After this you have to use the clip list to select clips for a defragmentation.

3.2 Using the Clip List

The video material found in the scanning process will be displayed in the clip list of the DVS Defragmenter. After a scanning it provides detailed information about the state (fragmentation degree) of the detected clips:

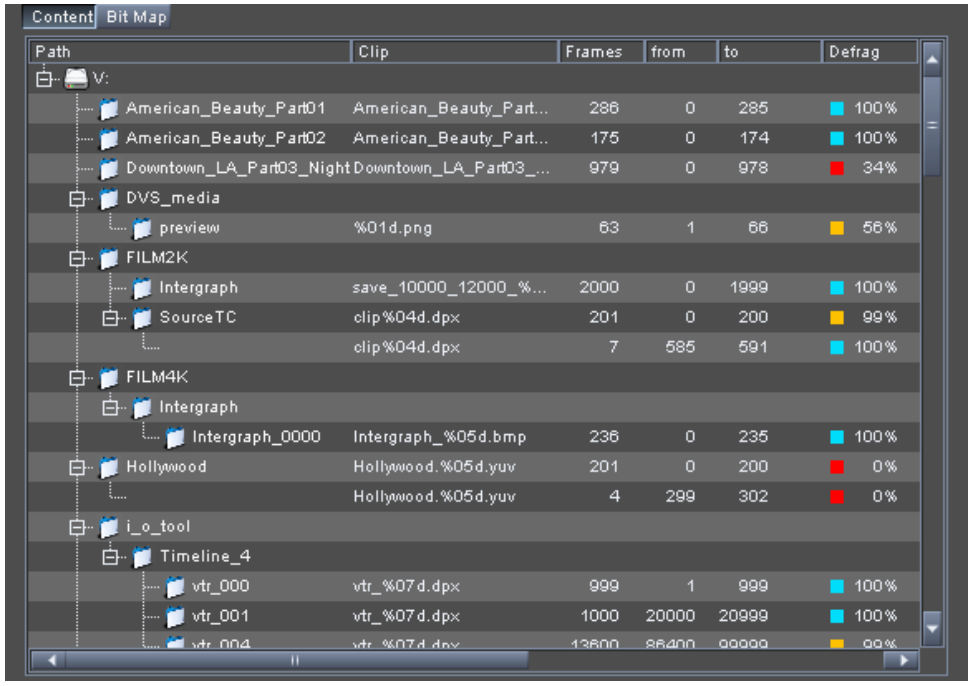


Figure 3-2: Clip list

The various columns of the clip list can be used to assess the fragmentation degree of the clips. By selecting whole volumes and/or individual directories (clips) from the clip list you have to assemble the job list which will afterwards be used for a defragmentation:

The DVS Defragmenter displays the fragmentation degree of video clips via colors. These do not indicate whether clips are real-time capable or not. Most video clips marked as fragmented will be real-time capable nevertheless.

- Double-click an entry in the clip list to add it to the job list for a defragmentation.

  Alternatively, you may also select an entry and use the button **ADD** from the defragmentation controls or the menu option ***Add to job list*** of the clip list's context menu.

This will add the volume/directory to the job list of the DVS Defragmenter. In case an entry is already selected for a defragmentation process or included in another job, its entry will appear briefly in the job list and afterwards vanish again. After this you may continue with the next step and refine the job list and/or start a defragmentation.

3.3 Defragmenting Clips

Once clips are available in the job list of the DVS Defragmenter, you can refine the job list by altering the sequence of the defragmentation and/or start a defragmentation, either an immediate or a scheduled one. To perform these steps you have to use the items in the lower part of the DVS Defragmenter's user interface:

Prior to a defragmentation it is imperative that you observe all notes detailed in section "Important Notes" on page 1-5.

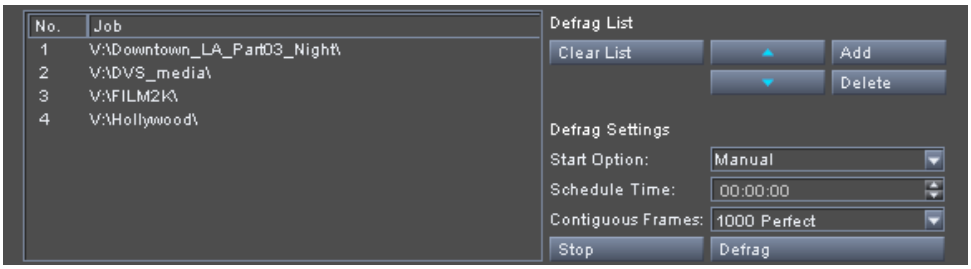


Figure 3-3: Job list with defragmentation controls

The job list will be processed in the order as listed, i.e. from top to bottom. In case you want to refine a defragmentation job list perform the following:

- Select a job from the job list to the left, for example, with a click of the mouse.
- Then use the arrow buttons (/) to change its position in the sequence of the appointed jobs.

With the button **DELETE** you can delete a selected job from the job list.

As soon as the job list is in the desired sequence, you can start a defragmentation:

- Use the settings item **Start Option** and, if applicable, **Schedule Time** to determine the way the defragmentation should be performed, i.e. assign either a scheduled or a manual (immediate) operation.
- With the setting **Contiguous Frames** set the number of frames that should be arranged for each clip continuously in one block on the hard disk array.
- When your settings are complete, start the defragmentation process with the button **DEFRAG**.

In case you chose a scheduled operation, a countdown will appear below the entry field to select a scanning location:

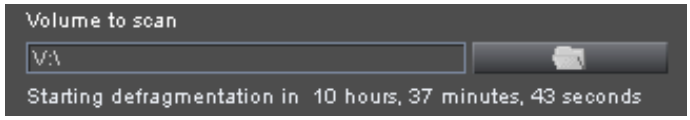


Figure 3-4: Countdown to defragmentation

To use a scheduled operation the DVS Defragmenter must remain running on your video system.

Once the time has elapsed or when a manual defragmentation has been selected, the DVS Defragmenter will start the defragmentation of the clips entered in the job list according to your settings. During this the clips will be arranged on the hard disk array so that they are more suited for a play-out operation. The defragmentation operation will be finished as soon as all clips included by the entries in the job list are processed.

You can abort either the countdown or a running defragmentation process at any time manually with the button **STOP** to the left of the button to initialized a defragmentation.

The User Interface

This chapter describes all items and possibilities of the user interface of the DVS Defragmenter. You may use it as a reference in case questions arise about the handling of individual items or their function.

First, a short overview of the DVS Defragmenter user interface will be given, followed by a description of the items available to scan a drive/directory. With the latter you create a clip list which will be displayed in the middle of the user interface. It is explained with all its features next in this chapter. After this the items of the job list, its administrative items as well as the defragmentation controls are detailed. This will be followed by an explanation of the status bar of the software. Last but not least, the chapter will be concluded with a description of other features provided by the DVS Defragmenter program, e.g. the keyboard shortcuts.

4.1 Overview of the User Interface

After starting the DVS Defragmenter (see section “Starting the Program” on page 2-4) the program will be loaded and the user interface will be displayed on the screen:

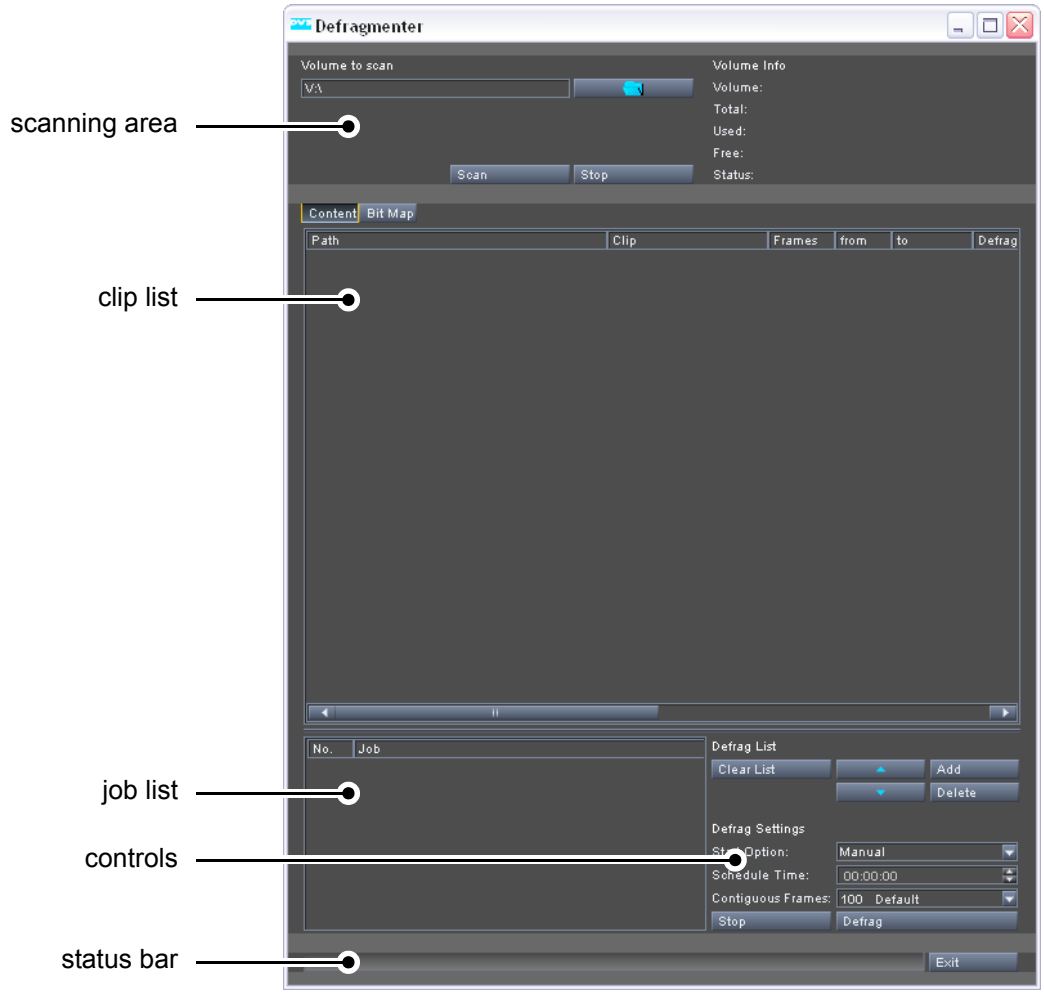


Figure 4-1: User interface of the DVS Defragmenter

In detail the user interface provides the following items:

scanning area — At its top the user interface of the DVS Defragmenter provides the scanning area. This area comprises items to start and stop a scanning process of the selected drive/directory as well as various information about the currently selected storage.

They will be described in detail in section “The Scanning Area” on page 4-4.

clip list — In the middle of the user interface you can find the clip list. After a scanning procedure it will list all clips found in the selected location with detailed information about their respective fragmentation state in a table. In addition, here you can also view a visual representation of the selected directory/drive.

The clip list and its features as well as the bit map view are explained in section "The Clip List and Its Visual Representation" on page 4-7.

job list — The job list details the drives or directories that you have chosen for a defragmentation.

It will be described with its administrative controls in section "The Job List and the Controls" on page 4-13.

controls — The controls comprise on the one hand the controls of the job list which can be used to administer the list, and on the other the controls of the defragmentation operation. With the latter you can initiate either a manual (immediate) or a scheduled defragmentation.

A description of both can be found in section "The Job List and the Controls" on page 4-13.

status bar — The status bar provides a progress bar that indicates the progress of a scanning as well as defragmentation process of individual clips. Furthermore, to its right you can find a button that you may use to exit the DVS Defragmenter.

These items are explained in section "The Status Bar" on page 4-16.

Additionally, the DVS Defragmenter provides several other useful features such as keyboard shortcuts which are detailed in section "Further Features" on page 4-17.

4.2 The Scanning Area

At its top the user interface of the DVS Defragmenter provides the scanning area. This area contains items to start and stop a scanning process of the selected drive/directory. Additionally, it details various information about the currently selected storage:

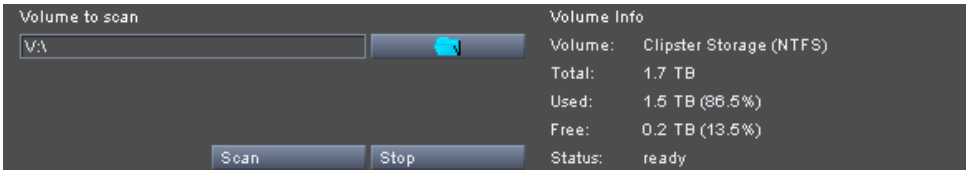


Figure 4-2: Scanning area

All items will be explained in the following:

Via a scanning you can also update a clip list or display previously hidden entries again.

The Items to Scan for Clips

The scanning area provides in detail the following items to scan for clips:

entry field

In the entry field either enter a drive letter to scan a volume completely for clips, or a path to a directory to scan a single folder only.

Notation: `drive_letter:\directory\subdirectory`

Instead of the backslash (`\`) you may also use a slash (`/`).

Example: `V:\Video`

Default value: `V:\`

To select a drive/directory directly via a dialog window you may also click on the button to the right of the entry field. Once confirmed, your selection will be entered in the entry field to the left.

SCAN

With the button **SCAN** you can initiate a scanning procedure which will scan the drive/directory determined by the entry field for video material. All clips found will be listed in the clip list below the scanning area. Depending on the amount of images/clips available in the selected location the scanning may take a while.

A detected defragmentation degree depends on the setting for contiguous frames of the defragmentation controls, i.e. when larger blocks are selected in **Contiguous Frames**, clips may be shown as segmented that would otherwise be displayed as 100% defragmented (see section "The Defragmentation Controls" on page 4-14).

STOP This button allows you to terminate a scanning operation in progress at any time manually.

Furthermore, below the entry field to select a scanning location a countdown may appear when you have chosen a scheduled operation for the scanning procedure (see section "The Job List and the Controls" on page 4-13).

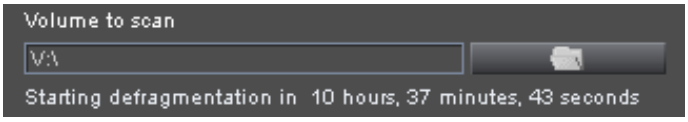


Figure 4-3: Countdown to defragmentation

Once the time detailed below the entry field has elapsed, the scheduled defragmentation operation will commence.

To use a scheduled operation the DVS Defragmenter must remain running on your video system.

The Volume Information Area

The volume information area to the right of the scanning items details data about the drive selected via the entry field of the scanning area:

Volume This field indicates some properties of the selected drive, i.e. its volume label and file system.

Total This entry details the amount of total disk space available on the selected drive.

Used This field shows you the amount of disk space that is currently in use on the drive selected by the entry field to the left (in bytes as well as percent).

Free Shows the amount of free disk space on the selected drive (in bytes as well as percent).

Status The field **Status** provides you with status messages about the operation of the DVS Defragmenter. They will be displayed as soon as an operation, such as a scanning or defragmentation, is performed. The status messages are also available on the progress bar of the status bar (see section “The Status Bar” on page 4-16).

The information will be displayed as soon as a location is scanned.

4.3 The Clip List and Its Visual Representation

After a scanning is initiated, the clip list will be filled with clips that could be found in the selected location.

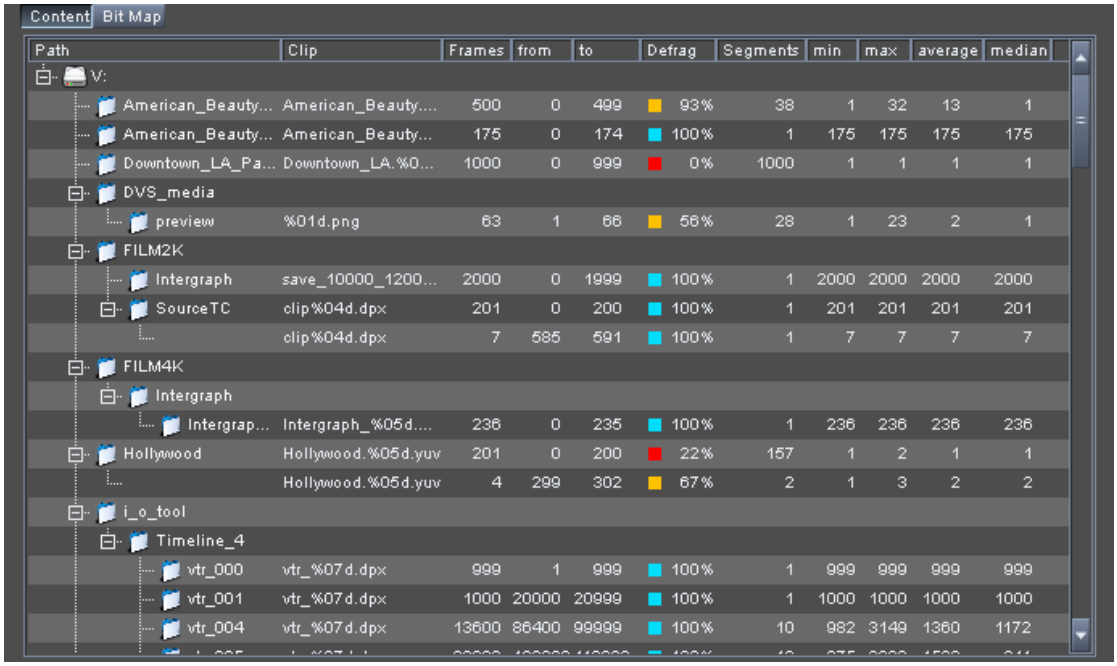


Figure 4-4: Clip list

The clip list can be used on the one hand to assess the state of individual clips on the hard disk array, and on the other to select volumes and/or directories for a later defragmentation. The selected volumes/directories are then added to the defragmentation job list (see section “The Job List and the Controls” on page 4-13). For the assessment you may also use a visual representation of the scanned location.

This section explains all items and features provided by the clip list and its visual representation.

It is possible to scan individual directories only or hide entries from the clip list (see section “The Context Menu” on page 4-10). In case entries are no longer available in the clip list, you can regain the full clip list again by simply scanning the volume/directory one more time. This way you can also update a clip list.

4.3.1 The Clip List

Via the clip list you can determine the state of individual clips on the hard disk array and assess their fragmentation degree. For this the clip list provides various columns:

Path This column shows the path to the directories and clips in a tree view. Use the minus or plus sign in front of each drive or directory to collapse or expand the branch that is sorted under this entry.

Clip Displays the file name of the clip (if applicable, in C notation).

Frames Indicates the number of frames that this clip provides (usually `<to> - <from> + 1`).

from This column shows the number of the first frame of the clip, usually given in its file name (its start index).

to Shows the number of the last frame of the clip that is sequently available, usually given in its file name (its stop index). Sequently available means that gaps present in an image sequence are detected by the DVS Defragmenter: Entries will be created for image sequences that are contiguously available. If frames are missing in a sequence, the respective clip will be displayed with at least two entries in the clip list:

Path	Clip	Frames	from	to
Hollywood	Hollywood.%05d.yuv	201	0	200
	Hollywood.%05d.yuv	4	299	302

Figure 4-5: Gap in clip resulting in two entries

Defrag Indicates the defragmentation degree of the respective clip with the help of colors and percentage values.

blue	100%. The clip is optimally aligned on the hard disk array.
orange	>= 50%. The clip exists in segments but should be sufficiently defragmented.
red	< 50%. The clip exists at least partially in fragments. Depending on resolution and file size this clip may cause problems during play-out operations.

The degree is calculated by the ratio of the available frames to the number of segments in relation to the other values detailed in the clip list.

A defragmentation degree of, for example, 0% does not mean that a clip is not real-time capable. Most clips marked as fragmented will be real-time capable nevertheless.

A detected defragmentation degree depends on the setting for contiguous frames of the defragmentation controls, i.e. when larger blocks are selected in **Contiguous Frames**, clips may be shown as segmented that would otherwise be displayed as 100% defragmented (see section "The Defragmentation Controls" on page 4-14).

Segments If a clip consists of more than one segment, its data is not aligned contiguously on the hard disk array in one large block but split up and stored at different locations. This value indicates the amount of data blocks (segments) found by the DVS Defragmenter for the respective clip. In principle you can say the following: The higher this value and the shorter your clip, the more fragmented the video material on the hard disk array.

min This value shows the amount of frames present in the smallest segment of the clip.

max Shows the amount of frames available in the largest segment of the clip.

average Details the arithmetic mean of the amount of frames available in all segments.

median Indicates the middle score of the amount of frames available in all segments.

By selecting whole volumes and/or individual directories (clips) from the clip list you have to assemble the job list which will afterwards be used for a defragmentation. For this use one of the following procedures which will all add the selected entry to the job list:

One or more entries from the clip list can be selected or deselected easily by applying the common procedures (e.g. hold down the [Shift] or [Ctrl] key while clicking with the mouse, see section "Keyboard Shortcuts" on page 4-17).

- Double-click an entry in the clip list.
- Select an entry and press the button **ADD** from the defragmentation controls.
- Select the menu option ***Add to job list*** on the context menu of a clip selected in the clip list.

This will add the selected volume/directory to the job list for a later defragmentation (see section "The Job List and the Controls" on page 4-13).

4.3.2 The Context Menu

The clip list provides further features via a context menu. To invoke it you usually have to perform a right-click of the mouse on an entry in the list:

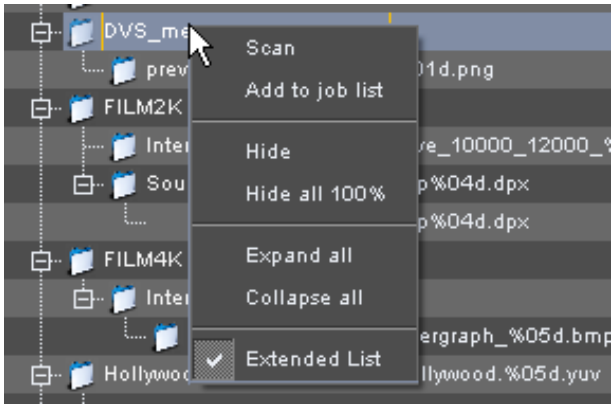


Figure 4-6: Context menu of clip list

You may use the context menu to perform the following:

Hidden entries can be regained by simply scanning the volume/directory once more. This way you can also update entries in the clip list.

Scan	Only scans the selected volume/directory anew and builds up again its branch in the clip list. If entries were hidden from the list, they will be displayed once again.
Add to job list	Adds the selected volume/directory to the job list.
Hide	Hides the selected entry from the clip list.
Hide all 100%	Hides all entries from the clip list that are optimally defragmented, i.e. the ones that show a defragmentation value of 100%. After this only the fragmented clips will be displayed in the list.
Expand all	Expands the whole tree and all branches in one step.
Collapse all	Collapses the whole tree and all branches in one step.
Extended List	By default the clip list is in its extended view and shows all columns as described in section “The Clip List” on page 4-8. With this menu option you can activate or deactivate the extended list view. If it is activated, the menu option will show a tick in front. In its deactivated state the clip list displays the columns **Path**, **Clip**, **Frames**, and **Defrag** only.

4.3.3 The Visual Representation of the Scanned Path

The area of the clip list also provides a visual representation of the scanned path after a scanning procedure has been performed. It can be accessed with the tab **Bit Map** at the top of this area:

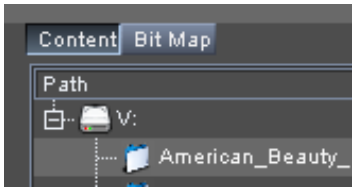


Figure 4-7: Tabs above the clip list

Once it is selected, something like the following will be displayed:

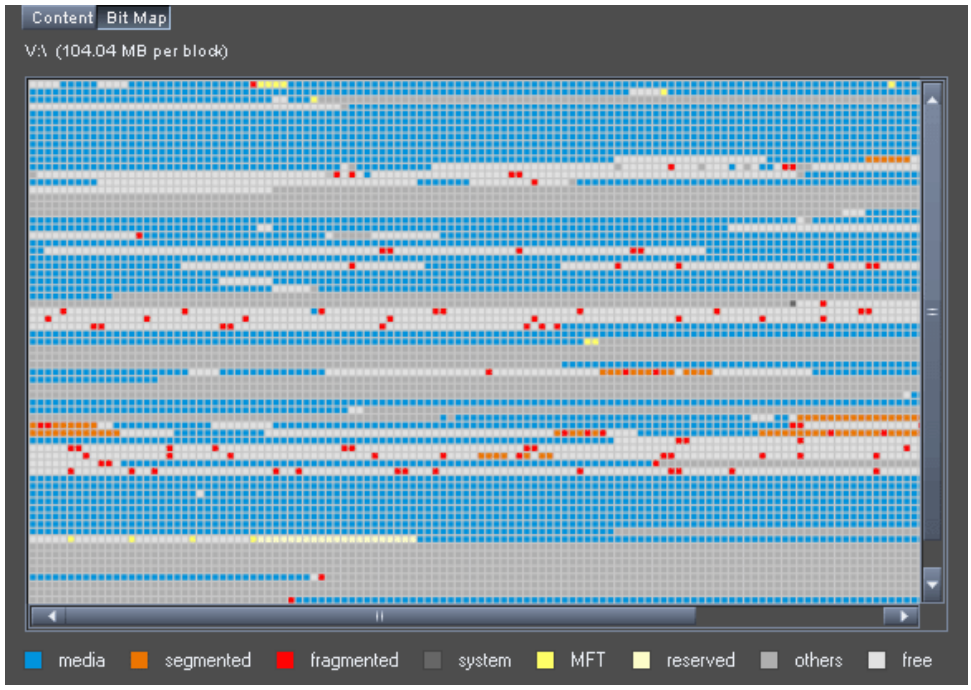


Figure 4-8: The visual representation

With the tab **Bit Map** activated the clip list area shows you a representation of the scanned path. The amount of data that is shown by each square (block) in the visual representation can be seen in brackets to the right the path indication of the scanned volume/directory (below the tabs). The visual representation has to be interpreted line-wise from left to right.

At the bottom of this area a color legend is provided that can be used to distinguish the different meanings of the colored squares:

media	The clips shown in this color are currently in a perfect state (100% defragmented). Only those clips that consist of files a DVS video system can handle will be displayed in this color.
segmented	The clips displayed in this color are segmented but still sufficiently defragmented (>= 50% defragmented). Only those clips that consist of files a DVS video system can handle will be displayed in this color.
fragmented	The files displayed in this color are fragmented and may cause problems during play-out operations (< 50% defragmented). All files that are fragmented will be displayed in this color.
system	Not used on SNFS.
MFT	Not used on SNFS.
reserved	Not used on SNFS.
others	All other files as long as they are not fragmented, such as project files of a DVS video system software or executables.
free	Free space is displayed with this color.

You can switch back at any time to the view of the clip list by activating the tab **Content**.

4.4 The Job List and the Controls

Below the clip list you can find the job list and controls areas. Together they provide the job list with its administrative controls as well as the controls for a defragmentation:

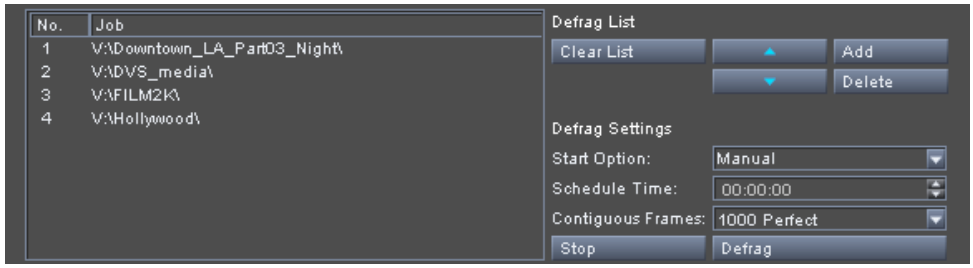


Figure 4-9: The job list and controls areas

With them you indicate the volumes/directories that have to be defragmented as well as control the defragmentation process. The features provided by this area are described in this section.

The Job List and Its Controls

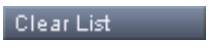
The job list details the drives or directories that you have selected for a defragmentation via the clip list (see section "The Clip List and Its Visual Representation" on page 4-7). They will be defragmented in the order indicated in the list, i.e. from top to bottom.

The DVS Defragmenter does not optimize the free space of a drive. Even when a whole volume is selected, it operates clip based still, meaning it optimizes single clips for play-out purposes only.

When selecting an entry in the clip list which is already selected for a defragmentation process or is included by another job, the respective entry will be highlighted in the job list. If such an clip list entry is added to the job list nevertheless, its entry will appear briefly in the job list and afterwards vanish again.

To the right of the job list you can find some controls that allow you to administrate the job list. In detail they provide the following functions:

One or more entries from the job list can be selected or deselected easily by applying the common procedures (e.g. hold down the [Shift] or [Ctrl] key while clicking with the mouse, see section "Keyboard Shortcuts" on page 4-17).



Deletes all entries available in the job list.

These buttons enable you to change the sequence of jobs in the list. Just select an entry in the job list and put it one position up or down in the list with the respective button.

Adds the entries that are currently selected in the clip list to the job list.

Deletes the entries that are currently selected in the job list from the list.

The Defragmentation Controls

As soon as the job list is in the desired sequence, you can start either a manual or a scheduled defragmentation at any time. To configure this use the defragmentation controls as follows:

Fragmented or segmented clips may still be real-time capable. Use the DVS Defragmenter only in case you experienced play-out problems (drops) and then only on the clip that is the cause for these troubles.

Prior to a defragmentation make sure to observe all notes detailed in section “Important Notes” on page 1-5.

Start Option

With this item select the operation mode of the defragmentation, i.e. either a manual or a scheduled one. The following settings are available:

`Manual`	Selects the manual operation mode where a defragmentation is carried out immediately
`Single Event`	Sets the DVS Defragmenter to a scheduled operation mode where a defragmentation is performed at a specified time and date; with this setting you have to configure with the field **Schedule Time** not only the time but a date as well
`Daily`	Determines a scheduled operation where the DVS Defragmenter will operate at a specified time every day
`Every <daysofweek>`	Selects a scheduled operation where the DVS Defragmenter will operate at a specified time every week (with `<daysofweek>` as the day of the week)

Schedule Time

This field will be available as soon as a scheduled operation mode is selected via the setting **Start Option**. With it you have to detail the time (system time) when to start the scheduled operation. When `Single Event` is selected, the format is `hh:mm:ss MM DD YYYY`. For all other scheduled operation settings the format is `hh:mm:ss`.

Contiguous Frames

With this setting set the number of frames that should be arranged for each clip continuously in one block on the hard disk array.

`1000 Perfect`	At least 1000 files per clip will be arranged contiguously; when using this setting, the defragmentation process may take some time
`100 Default`	Default setting; at least 100 files will be arranged contiguously
`25 Fast`	At least 25 files per clip will be arranged in one block; by using this setting, you can perform a quick defragmentation.

The setting **Contiguous Frames** may affect a the defragmentation degree detected during a scanning operation, i.e. when larger blocks are selected with this combo box, clips may be shown as segmented that would otherwise be displayed as 100% defragmented.

This button enables you to terminate a defragmentation operation in progress at any time manually.

This button starts a defragmentation operation. When a scheduled operation is selected, a countdown will appear below the entry field to select a scanning location (see section “The Scanning Area” on page 4-4). Once the time has elapsed or when a manual operation mode is selected, the DVS Defragmenter will start the defragmentation of the clips entered in the job list according to your settings. During this the clips will be arranged on the hard disk array so that they are more suited for a play-out operation. The defragmentation operation ends automatically as soon as all clips included by the entries in the job list are processed.

4.5 The Status Bar

The status bar provides a progress bar that indicates the progress of a scanning or defragmentation process of individual clips.

Figure 4-10: Progress bar

All states of the DVS Defragmenter such as scanning, analyzing, detecting, moving, etc. will be indicated by the progress bar. Nevertheless, due to the fact that the DVS Defragmenter operates clip based only, the different states will be detailed for each clip individually, meaning it will not be detailed, for example, how long it will take to defragment several selected clips. The states indicated by the progress bar will also be shown by the field **Status** of the scanning area (see section "The Scanning Area" on page 4-4).

Furthermore, to the right of the progress bar you can find the button **EXIT** that you may use to close the DVS Defragmenter program.

4.6 Further Features

In addition to the items of the visible user interface the DVS Defragmenter provides several other useful features such as keyboard shortcuts or log files. They will be described in this section.

4.6.1 Keyboard Shortcuts

For a more easy work with the DVS Defragmenter there are various keyboard shortcuts available which are listed in the table below:

Shortcut	Action
[Alt + A]	Stop a scan in progress
[Alt+ S]	Start a scan of the selected location
[Alt + D]	Start a defragmentation
[F1]	Display version information, MAC address as well as serial number (ID) of the DVS PCI video board
[Alt + E]	Exit and close the program
[Ctrl + A]	Select all entries in clip or job list (last selected one)

Additionally, the following combination of keyboard and mouse actions may be helpful:

Key/Mouse Action	Action
Hold [Ctrl] while selecting with the mouse	Select several entries in a list disjointedly
Hold [Shift] while selecting with the mouse	Select a range of adjoining entries in a list

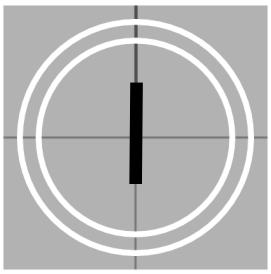
4.6.2 Log Files

To aid a debugging the DVS Defragmenter stores log files that detail the actions that you have performed with the program. You may get asked by the DVS service department to send in these files when you experienced operation problems with the DVS Defragmenter.

At the most two log files will be created both containing up to 5 MB of data. First, a file carrying the name *defrag.txt* will be created. Once it contains 5 MB of data, it will be renamed to *defrag_old.txt* and another *defrag.txt* is started. If this reaches the 5 MB threshold as well, the older log file will be overwritten with this file while another *defrag.txt* is started once more.

The log files will be stored usually in the installation path of the DVS Defragmenter in the subdirectory `log` (see section “Installation” on page 2-2).

On a DVS video system such as CLIPSTER, if the DVS Defragmenter is ex factory already installed, the log files will be saved in the subdirectory `log` of the DVS main software's installation path.



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